UNITED
NATIONS

ST

Secretariat

GENERAL

ST/SG/AC.10/C.3/1997/2
11 April 1997

Original: ENGLISH

COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item 3 (d))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

Proposal for amendment to Chapter 3.4 - Limited Quantities

Transport of samples of unknown properties

Transmitted by the European Chemical Industry Council (CEFIC)

Introduction

The transport of small samples of products for which all dangerous properties are not known is often necessary e.g. sending of sample to a laboratory to determine its dangerous properties for transport classification purposes; the correct classification of such products is not possible and therefore the right transport conditions cannot be specified.
The research departments need appropriate recommendations for the transport of such not fully tested samples in small quantities.

Proposal

Insert in Chapter 3.4 dealing with "Limited Quantities" a subsection dealing with "Samples of unknown properties" including the following paragraph :

1. The recommendations of this subsection concern the transport of samples which are not fully tested and, therefore, all dangerous properties are not known.

2. The recommendations, hereafter, do only apply to substances (including mixture and solution) which might have dangerous properties but are not completely tested. They do not apply to explosives, gases, organic peroxides, infectious substances or radioactive material.

3. Dangerous goods samples transported according to these special recommendations should be transported in quantities up to 2.5 kg in inner packagings in suitable outer packagings.
The packagings should meet the requirements of 4.1.1.1, 4.1.1.2, 4.1.1.3, 4.1.1.4, 4.1.1.5, 4.1.1.7 and 4.1.1.8. They should be so designed that they meet the construction requirements of 7.1.4.

4. Dangerous goods samples may not be packed together with other dangerous or non dangerous goods.

5. Dangerous goods samples may not be loaded in a vehicle or freight container together with packagings bearing the labels N° 1, 1.4, 1.5, 1.6 and 01 according to 5.2.2.2.2.1 and 5.2.2.2.2.2.

6. Packages of dangerous goods samples transported according to these special recommendations need not be labelled. They should be durably marked as "DANGEROUS GOODS-SAMPLE" on the outer packaging.

7. For consignments of dangerous goods samples the requirements for documentation specified in 13.6 do not apply. The transport document should include the description "Dangerous goods-sample(s)" and the total quantity covered by the description (by volume or mass).

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DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

UN 1305 - Vinyltrichlorosilane, inhibited

Transmitted by the European Chemical Industry Council (CEFIC)

Introduction

The name and description of UN number 1305 is "Vinyltrichlorosilane, inhibited" in the present UN Recommendations.
Experience has shown however, no evidence of thermal instability of this product.
Extensive test programmes have been conducted that demonstrate the thermal stability of Vinyltrichlorosilanes.

Proposal

Delete the provision "inhibited" from the description of UN 1305.

Enclosure I

WACKER
Wacker-Chemie GmbH

Stability of vinyltrichlorosilane (UN-No. 1305)

Since many years Wacker-Chemie GmbH is producing vinyltrichlorosilane. From the beginning on there has never been used a stabilizer in the production process, for storage, handling and shipment of vinyltrichlorosilane.
From the experience with vinyltrichlorosilane Wacker-Chemie is able to certify that this compound is stable and doesn't show spontaneous polymerization or decomposition.
Vinyltrichlorosilane can be distilled (b.p. 92 °C) at normal pressure without problems.
There has never been any accident which was attributable to a thermal instability of vinyltrichlorosilane.
DSC (differential scanning calorimetry) measurements clearly demonstrate the thermal stability of vinyltrichlorosilane in the pure state.

WACKER-CHEMIE GMBH
Geschäftsbereich S
Werk Burghausen
S-F-P

Dr. Müller R. Dr. Artes

Enclosure I

MW M GG WB
03. Feb. 1997

HÜLS

HULS AKTIENGESELLSCHAFT

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Wacker-Chemie GmbH
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Johannes-Hess-Straße 24
84489 Burghausen

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Unser Zeichen / Unsere Nachricht vom | Telefon-Name (02365) 49 2603 | Marl
MW-M-GG/WB | H. Engel | 97-01-28

Addendum "inhibited" to Vinyltrichlorosilane - UN 1305

Dear Mr. Aigner

we refer to your telefax-message, dated 17-01-97, concerning the addendum "inhibited" to the proper shipping name of the product Vinyltrichlorosilane, UN-No 1305.

Herewith we confirm, that our Vinyltrichlorosilane, saled under the trade name **DYNASYLAN VTC®**, is transported without any inhibition. Therefore the term "inhibited" is not applicable.

With best regards

HULS AKTIENGESELLSCHAFT

Florin

Forst

encl.
Safety data sheet (EC)

Vorsitzender des Aufsichtsrates: Dr. Utz Claassen
Vorstand: Dr. Jürgen Meyer-Gatow, Vorsitzender, Klaus D. Albrecht, Volkbert Bode, Armin J. Bode, Alfred Chemnitz, stellv., Peter Kurwien, Dr. Rüdiger Sutter
Sitz der Gesellschaft: Marl, Handelsregister Nr. HRB 2592, Amtsgericht

Enclosure II

DRAFT

Figure 1.1

DATA SHEET FOR SUBSTANCES SUBMITTED TO THE UNITED NATIONS FOR NEW OR AMENDED CLASSIFICATION

Submitted by . . . . . Date . . . . . .

Supply all relevant information including sources of basic classification data.
Data should relate to the product in the form to be transported.
State test methods.
Answer all questions - if necessary state "not known" or "not applicable" - If data is not available in the form requested, provide what is available with details.
Delete inappropriate words.

Section 1. SUBSTANCE IDENTITY

1.1 Chemical name . Vinyltrichlorosilane

1.2 Chemical formula $CH_2=-SiCL_3$

1.3 Other names/synonyms . Ethenyltrichlorosilane

1.4.1 UN number 1305 1.4.2 CAS number 75-94-5

1.5 Proposed classification for the Recommendations

1.5.1 proper shipping name (13.8 */) Vinyltrichlorosilane

1.5.2 class/division . . . 3 . . . subsidiary risk(s) . 8

packing group . I

1.5.3 proposed special provisions, if any

1.5.4 proposed packing method . . M

Section 2. PHYSICAL PROPERTIES

2.1 Melting point or range <-78 °C

2.2 Boiling point or range +92 °C

2.3 Relative density at :

2.3.1 15 °C . . . not known

2.3.2 20 °C 1,24g/cm^3
25°C 1,26g/cm^3

2.3.3 50 °C . . . not known

---

*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods.*

2.4 Vapour pressure at :

2.4.1 50 °C 23,5 kPa

2.4.2 65 °C 45,2 kPa

2.5 Viscosity at 20 °C (1.10 */) $0,5 \times 10^{-6}$ m^2/s

2.6 Solubility in water at 20 °C n.a. g/100 ml reacts violently with water

2.7 Physical state at 20 °C (1.10 and 1.15 */) ~~solid~~/liquid/~~gas~~

2.8 Appearance at normal carriage temperatures, including colour and odour

colourless liquid with pungent odour

2.9 Other relevant physical properties formation of HCl clouds with moist air

Section 3. FLAMMABILITY

3.1 Flammable vapour

3.1.1 Flash point (5.4 */) 13 °C ~~cc~~/cc
3.1.2 Is combustion sustained? (5.7 */) ~~yes~~/no

3.2 Autoignition temperature 270 °C

3.3 Flammability range (LEL/UEL) ... % not known

3.4 Is the substance a flammable solid ? ~~yes~~/no

3.4.1 If yes, give details (also complete 4.5.1 and 4.5.2 if relevant)(1.21 */)

./.

Section 4. CHEMICAL PROPERTIES

4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity ? ~~yes~~/no

If yes, state

4.1.1 Inhibitor/stabilizer used ..... none.....

4.1.2 Alternative method .....

4.1.3 Time effective at 55 °C .....

4.1.4 Conditions rendering it ineffective .....

---

*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods.*

4.2 Does the substance react with water ? ~~yes~~/no

4.2.1 If yes, state effects . . formation of HCl clouds
. . . . . formation of hydrochloric acid (excess of water used)
. . . . . formation of solid (silicic acid)

4.3 Does the substance have explosive properties ? (4 *!) ~~yes~~/no

4.3.1 If yes, give details . . . . . .

4.4 Does the substance have oxidizing properties ? (1.22 *!) ~~yes~~/no

4.4.1 If yes, give details . . . . . .

4.5 Is the substance a self-reactive substance (1.21 *!) or an organic peroxide (1.22*!)?
~~yes~~/no

If yes, is temperature control required (11.3.5/14.2.2.5 *!)? yes/no

If yes state

4.5.1 proposed control temperature (11.3.5.3 *!) . . . °C

4.5.2 proposed emergency temperature (11.3.5.3 *!) . . . °C

4.6 Corrosivity (8 *!) to :

4.6.1 mild steel 0,0075 . . mm/year at 50 . °C

4.6.2 aluminium . . . mm/year at . . . °C not known

4.6.3 other packaging materials (specify) . . . . . mm/year at . . . °C

4.7 Other relevant chemical properties . highly flammable, reacts violently with water, alcohols, protic solvents

Section 5. HARMFUL BIOLOGICAL EFFECTS

5.1 LD 50, oral (6.2.1*!) . . . mg/kg * Animal species . . . . . .

5.2 LD 50, dermal (6.2.2*!) . . . mg/kg * Animal species . . . . . .

5.3 LC 50, inhalation (6.2.3*!) . . . mg/litre * Exposure time . . . . . hours

or . . . ml/m³ * Animal species . . . . . .

*not known

! *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods.*

5.4 Saturated vapour concentration at 20 °C (6.3.3 [1]) mL/m³ not known

5.5 Skin exposure (8 [1]) results not known Exposure time hours/minutes
Animal species

5.6 Other data

5.7 Human experience Causes severe burns
Causes irritation to respiratory system

Section 6. SUPPLEMENTARY INFORMATION

6.1 Recommended emergency action

6.1.1 Fire (include suitable and unsuitable extinguishing agents)
suitable: medium excansion foam, carbondioxide
unsuitable: water, halones

6.1.2 Spillage: use acid binding material

6.2 Is it proposed to transport the substance in

6.2.1 Intermediate Bulk Containers (16 [1]) yes ~~no~~

6.2.2 Multimodal tanks (17 [1]) yes ~~no~~

If yes, give details in Sections 7 and/or 8

Section 7. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 6.2.1)

7.1 Proposed type(s): pressure cylinders (steel)

Section 8. MULTIMODAL TANK TRANSPORT (only complete if yes in 6.2.2)

8.1 Description of proposed tank (including IMO tank type if known)

IMO 1

8.2 Minimum test pressure 4 bar

8.3 Minimum shell thickness 6 mm

8.4 Details of bottom openings, if any no botton openings allowed

8.5 Pressure relief arrangements bursting disk in front of pressure relief valve

8.6 Degree of filling 95 %

8.7 Unsuitable construction materials aluminium, nonferrous metal

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[1] *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods.*

Annex

Enclosure II

WB-A-CT/Dr Ba

Burghausen, 19.02.1997

Copies to:
CL
S-E-P/WB, Dr Artes
MW-M/GG2/WB, Hr Aigner

WACKER-CHEMIE GmbH
Central Safety Laboratory
Report 02/97

Thermal stability of chlorosilanes and silazanes containing vinyl groups

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Author: Dr Konrad Bachhuber

Summary:

In Chapter 2 "List of dangerous goods most commonly carried" and Table 12.2 "List of substances of classes 3 to 9 transported in tank containers" of the UN Recommendations, vinyltrichlorosilane is quoted with the provision "INHIBITED"

To clarify the question of whether vinylsilanes are thermally stable without inhibitor extensive test programmes have been conducted to demonstrate the thermal stability of vinyltrichlorosilane

The results presented here show that the reactivity of the vinyl groups in silanes or silazanes is not comparable to that of common monomers such as acrylates and vinyl acetate. Our measurements have shown that all the unstabilized silanes and silazanes investigated are much more thermally stable than stabilized monomers like acrylic acid an vinyl acetate. In addition, impurities such as rust or iron salts do not have any significant destabilizing effect

In view of these findings **it is unreasonable to demand the stabilization of Silane V**. If it were dangerous on account of its thermal properties, all common monomers such as vinyl acetate, acrylic acid, acrylates etc. would have to be banned completely, because even when stabilized they are much more unstable than Silane V

Bachhuber

1. INTRODUCTION

In Chapter 2 "List of dangerous goods most commonly carried" and Table 12.2 "List of substances of classes 3 to 9 transported in tank containers" of the UN Recommendations, vinyltrichlorosilane is quoted with the provision "INHIBITED"

To clarify the question of whether vinylsilanes are thermally stable without inhibitor extensive test programmes have been conducted to demonstrate the thermal stability of vinyltrichlorosilane

2. TEST PROGRAMM

Experimental method: Differential Scanning Calorimetry (DSC)

Equipment: METTLER-DSC System TA8000 with DSC-20-ovens

Dynamic DSC-measurements: Samples of 20-50 mg of the substances were filled into pressure-resistant steel crucibles with glass inserts (as an inert surface), and were heated at a rate of 5 °/min to 600 °C. The thermograms obtained, which indicate the observed heat flow rates (see fig. 1-9)

Samples tested

1 Silane V = Vinyltrichlorosilan
2 Silane V with the addition of 0.3 wt % rust
3 Silane V with the addition of 0.6 wt % $FeCl_3$
4 Silane V with the addition of 0.4 wt % $FeCl_3$
5 Silane VM
6 Silane VM with the addition of 0.4 wt % rust
7 Silane VM2
8 Silazane VMN
9 Silazane VMN with the addition of 0.5 wt % rust

3. RESULTS

Results of the quantitative evaluation are summarized in following table

Sample/ Figure	Description	Measure-ment[1]	Crucible	Peak [°C]	Energy [J/g]	Note
1	Silane V	25/5/600	V4A steel + glass	268-572	-468	strongly exothermic
2	Silane V + 0.3% rust	25/5/600	V4A steel + glass	264-450	-330	strongly exothermic
3	Silane V + 0.6% $FeCl_3$	25/5/600	V4A steel + glass	100-184 252-542	-11 -366	weakly exothermic strongly exothermic
4	Silane V + 0.4% $FeCl_3$	25/5/600	V4A steel + glass	267-554	-363	strongly exothermic
5	Silane VM	25/5/600	V4A steel + glass	269-542	-483	strongly exothermic
6	Silane VM + 0.4% rust	25/5/600	V4A steel + glass	271-540	-186	exothermic
7	Silane VM2	25/5/600	V4A steel + glass	249-535	-502	strongly exothermic
8	Silazane VMN	25/5/600	V4A steel + glass	143-212 285-452	-5 -448	weakly exothermic strongly exothermic
9	Silazane VMN + 0.5% rust	25/5/600	V4A steel + glass	158-218 285-461	-5 -467	weakly exothermic strongly exothermic
10	Acrylic acid, stabilized with 200 ppm HQMe[2]	25/2/200	glass	147-166	-845	strongly exothermic
11	Vinyl acetate, stabilized with 5 ppm HQ[3]	25/2/250	glass	133-230	-269	strongly exothermic

1) Initial temperature (°C) / heating rate (°C/min) / final temperature (°C)

2) HQMe = Hydroquinone-monomethylether

3) HQ = Hydroquinone

4. DISCUSSION

Thermal stability of the investigated compounds

All the compounds investigated, when heated, are stable up to at least 200 °C. The thermal stability of these **unstabilized** compounds thus greatly exceeds that of common **stabilized monomers**, such as acrylic acid and vinyl acetate, which undergo vigorous (in some cases explosive) polymerization when heated to 120 - 150 °C (see Figs 10+11).

Note: The weak exothermic effects observed for samples 3, 8 and 9 are absolutely harmless (adiabatic temperature increase 5-10°). We can only detect them at all because our measurement technique is so sensitive. From DSC measurements alone, it is impossible to say what is causing them.

Effect of impurities such as rust and iron salts on thermal stability

The addition of rust, $FeCl_2$ and $FeCl_3$, has no noticeable destabilizing effect on the compounds investigated. In this respect, too, these compounds are much more robust than the aforementioned monomers.

Conclusion

The results presented here show that the reactivity of the vinyl groups in silanes or silazanes is not comparable to that of common monomers such as acrylates and vinyl acetate.

Our measurements have shown that all the unstabilized silanes and silazanes investigated are much more thermally stable than the aforementioned, stabilized monomers. In addition, impurities such as rust or iron salts do not have any significant destabilizing effect.

In view of these findings it **is unreasonable to demand the stabilization of Silane V**. If it were dangerous on account of its thermal properties, all common monomers such as vinyl acetate, acrylic acid, acrylates etc. would have to be banned completely, because even when stabilized they are much more unstable than Silane V.

Bart: Ruber

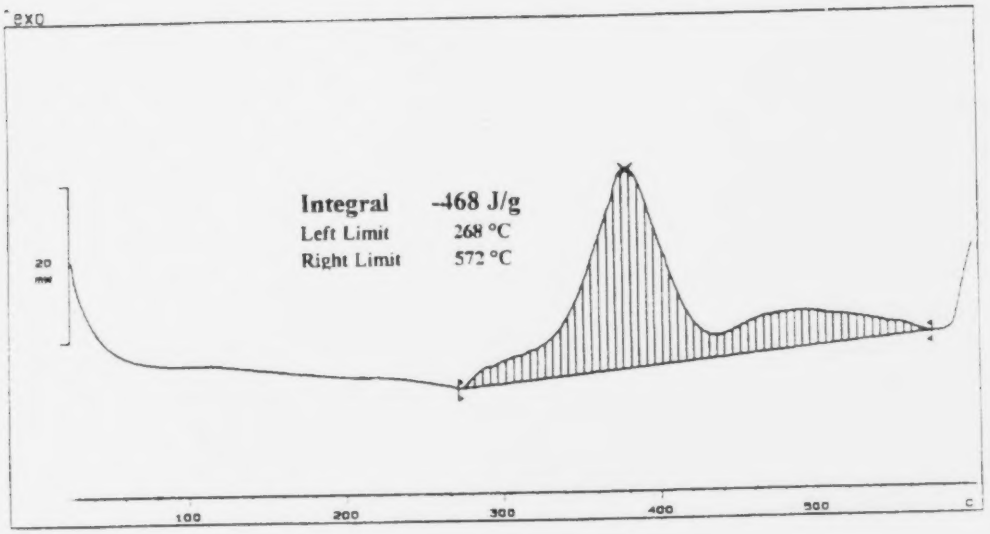

Figure 1: Dynamic DSC-Measurement

Sample: Silane V (51.93 mg)
crucible: V4A steel + glass insert
heating rate: 5°/min

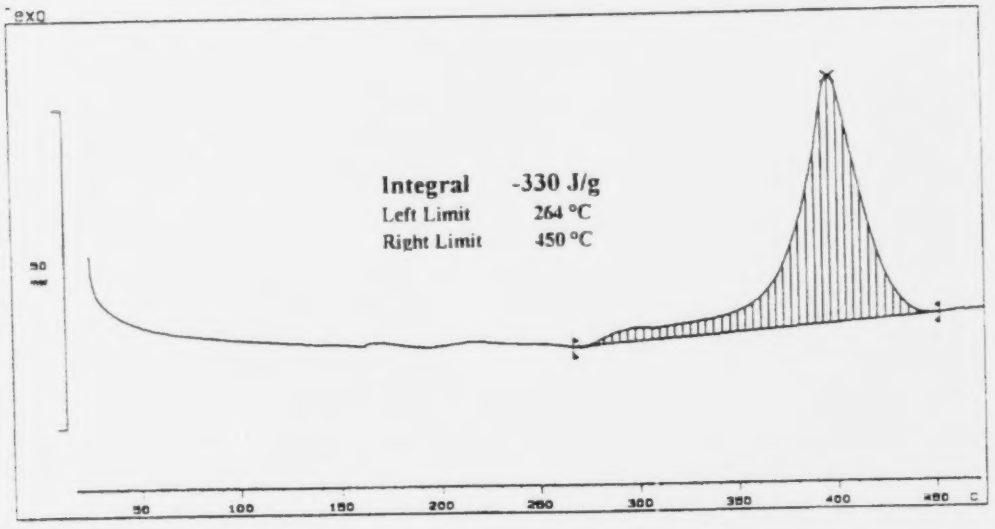

Figure 2: Dynamic DSC-Measurement

Sample: Silane V (54.13 mg) + 0.3 wt % rust
crucible: V4A steel + glass insert
heating rate: 5°/min

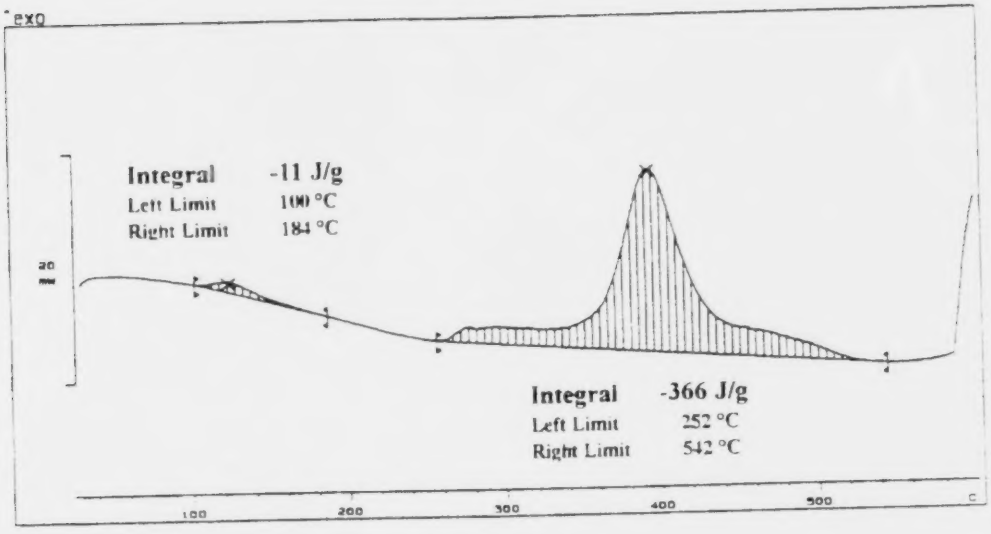

Figure 3: Dynamic DSC-Measurement

Sample: Silane V (32.93 mg) + 0.6 wt % $FeCl_3$
crucible: V4A steel + glass insert
heating rate: 5°/min

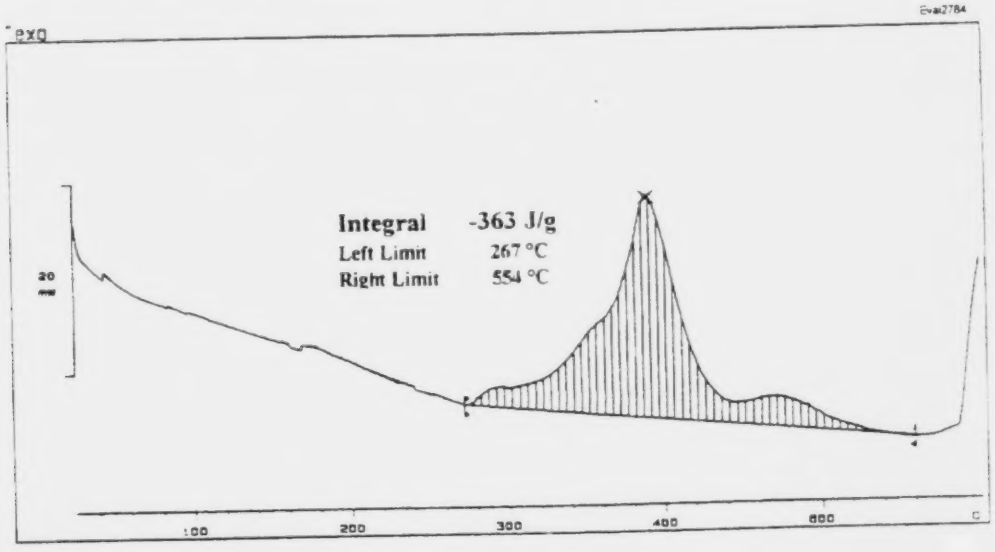

Figure 4: Dynamic DSC-Measurement

Sample: Silane V (50.30 mg) + 0.4 wt % $FeCl_3$
crucible: V4A steel + glass insert
heating rate: 5°/min

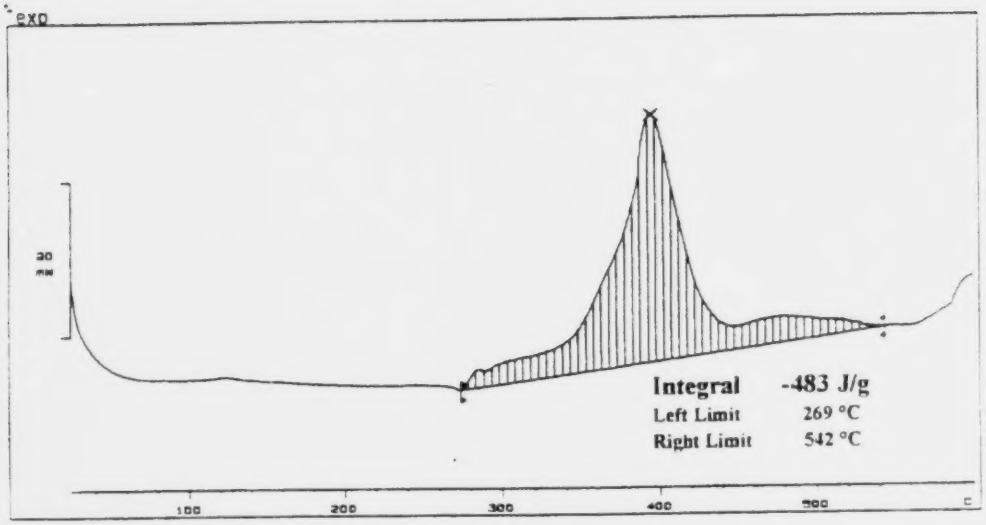

Figure 5: Dynamic DSC-Measurement

Sample	Silane VM (47.40 mg)
crucible	V4A steel + glass insert
heating rate	5°/min

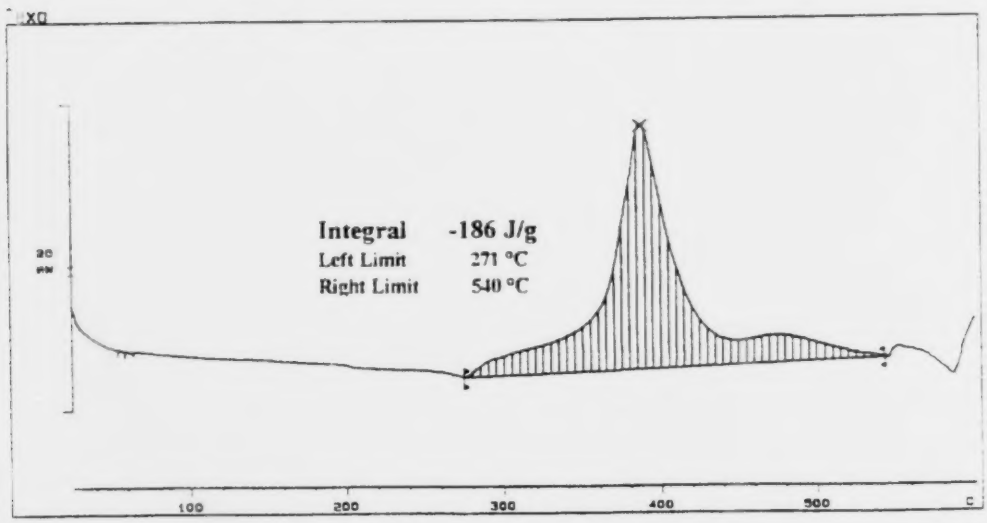

Figure 6: Dynamic DSC-Measurement

Sample	Silane VM (56.52 mg) + 0.4 wt % rust
crucible	V4A steel + glass insert
heating rate	5°/min

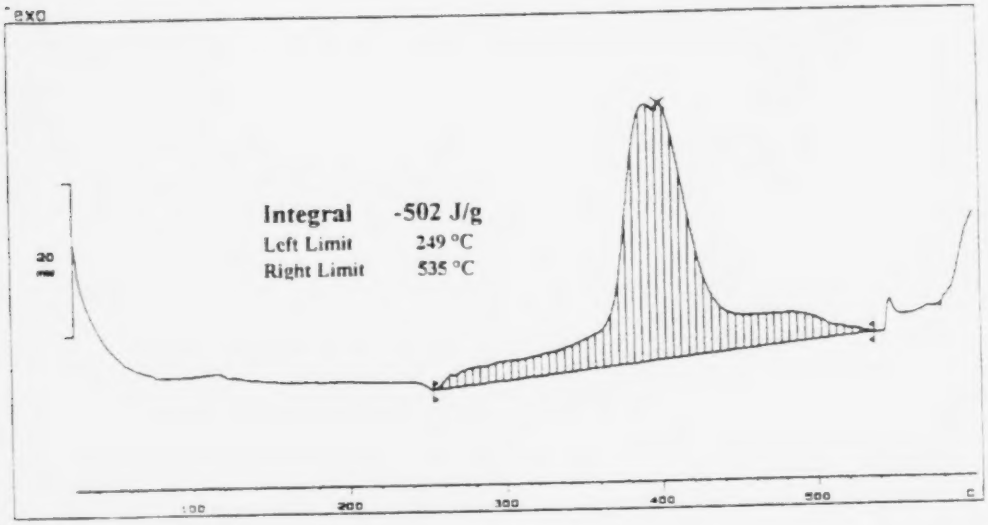

Figure 7: Dynamic DSC-Measurement

Sample	Silane VM2 (50.54 mg)
crucible	V4A steel + glass insert
heating rate	5°/mn

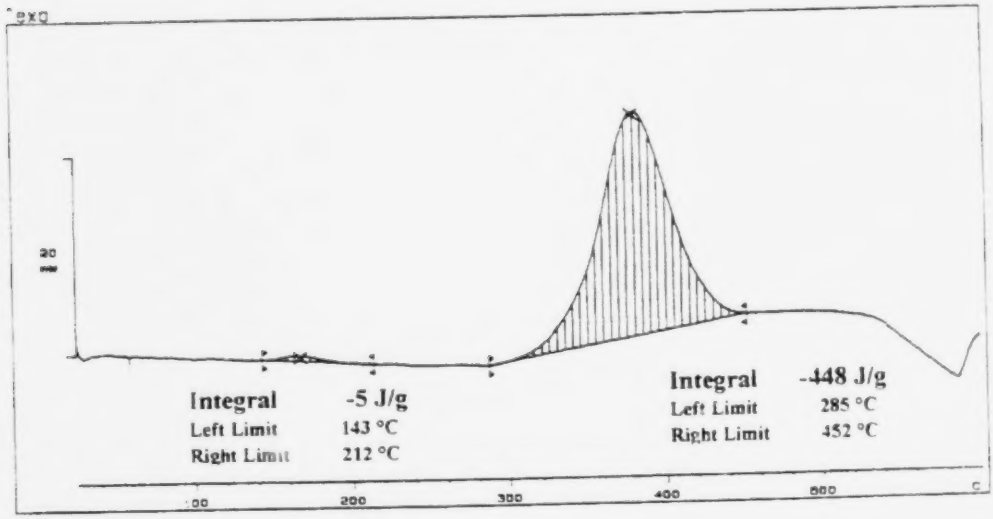

Figure 8: Dynamic DSC-Measurement

Sample:	Silazane VMN (32.39 mg)
crucible:	V4A steel + glass insert
heating rate:	5°/mn

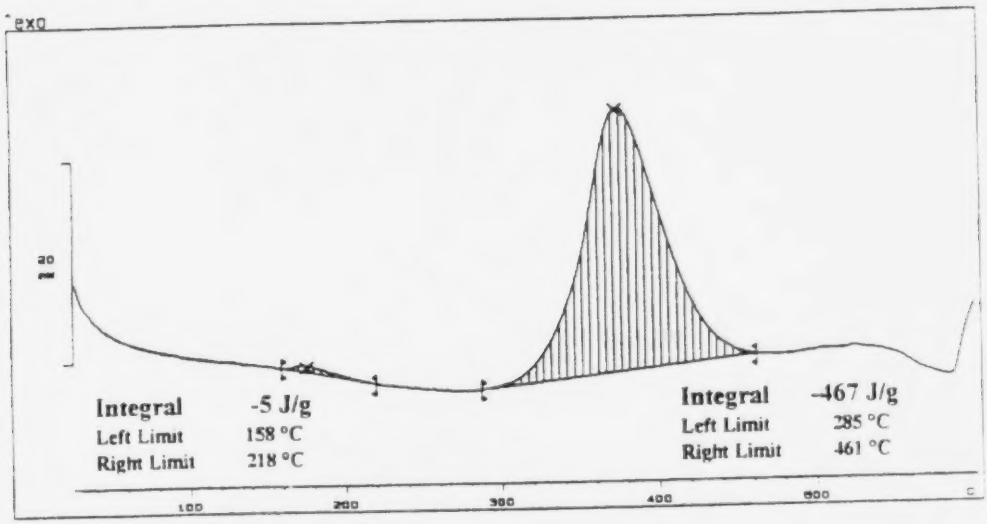

Figure 9: Dynamic DSC-Measurement
Sample: Silazane VMN (38.97 mg) + 0.5 wt % rust
crucible: V4A steel + glass insert
heating rate: 5°/min

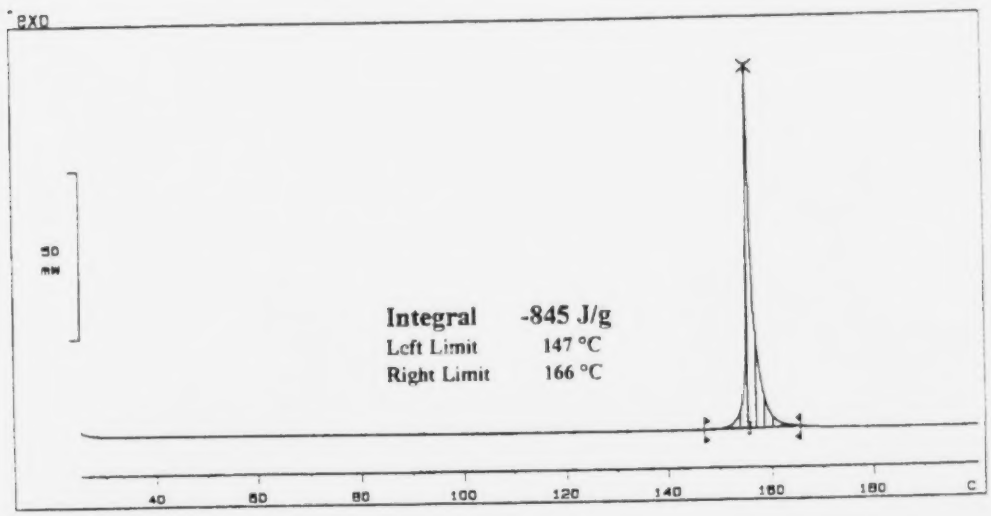

Figure 10: Dynamic DSC-Measurement
Sample: Acrylic acid (6.18 mg), stabilized with 200 ppm HQMe
crucible: glass
heating rate: 2°/min

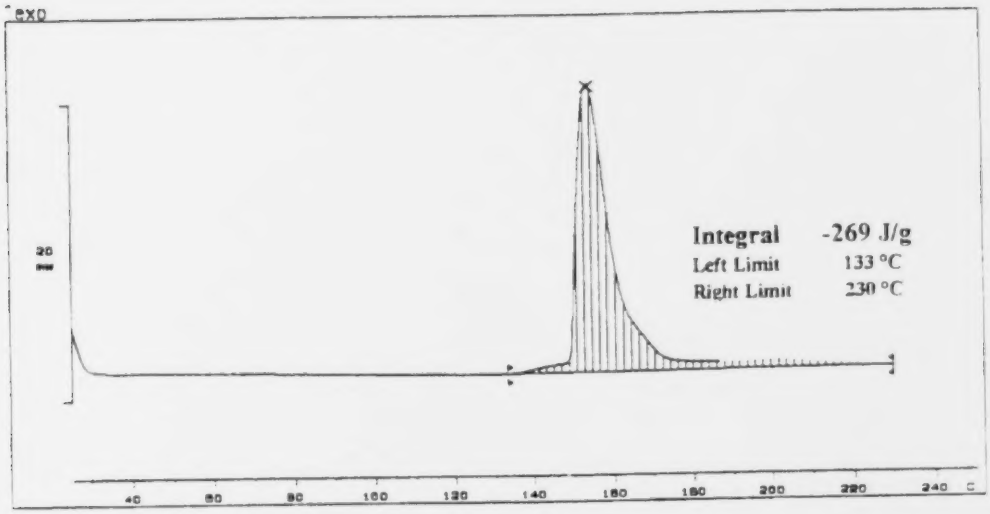

Figure 11: **Dynamic DSC-Measurement**

Sample	Vinyl acetate (24.19 mg), stabilized with 5 ppm HQ
crucible	glass
heating rate	2°/min

Annex

Safety data sheet (EC)

Enclosure II

hüls

Revision: 25.10.95
Ref.: EN 100 2001/96

print date: 28.01.97

1. Identification of the substance/preparation and of the company/undertaking

- Product name:
  DYNASYLAN VTC
  VINYLTRICHLORSILANE

- Company:
  Hüls AG, P.O. Box, D-45764 Marl
  Telephone: +(0)2365-49-4705, Fax 49-4101 (Product safety dept.)
  Emergency Tel.No: +(0)2365-49-2232, Fax 49-4423 (Works fire brigade, Hüls AG)

2. Composition/information on ingredients

trichloro(vinyl)silane
CAS No.: 75-94-5 Index No.: - EEC-No.: 200-917-8
Hazard symbol: C-F R-phrases: 11-14-22-35-37

3. Hazards identification

Highly flammable.
Reacts violently with water.
Harmful if swallowed.
Causes severe burns.
Irritating to respiratory system.

4. First-aid measures

Take off immediately all contaminated clothing.

- After inhalation:
  Provide fresh air. Monitor breathing, give oxygen if necessary, seek medical advice.
- After skin contact:
  Wash off with plenty of water and soap immediately, seek medical advice if necessary.
- After eye contact:
  Rinse immediately with plenty of water for 15 minutes and seek advice of an eye specialist.
- After ingestion:
  Rinse mouth immediately with plenty of water and then drink plenty of water. Seek medical advice immediately.

5. Fire-fighting measures

- Suitable extinguishing media:
  foam, CO2, dry powder
- Unsuitable extinguishing media:
  water
- Special hazards:
  Hazardous fumes in fires, specific to the produkt: hydrogen chloride
- Special protective equipment:
  Have ready/wear respiratory protection equipment.

6. Accidental release measures

- Personal precautions:
  Wear personal protective equipment. Keep away from sources of ignition - no smoking.
- Environmental precautions:
  Keep away from drains, waters and soil.
- Methods for cleaning up:
  Take up mechanically or with an absorbent material. Suitable absorbents: kieselgur, universal absorbent.
  Fill into marked, sealable containers.

7. Handling and storage

- Handling:
  Protect from moisture. Provide good ventilation or extraction.
- Protection against fire/explosion:
  Take precautionary measures against static charges. Keep away from sources of ignition - no smoking.
  Explosion protection equipment required.
- Storage:
  Keep containers tightly closed and store in a cool, well-ventilated place. Protect from moisture.

8. Exposure controls/personal protection

- Technical measures:
  Provide sufficient ventilation.

- Ingredients with limiting values to be controlled:

hüls

Safety data sheet (EC)

Revision: 25.10.95 print date: 28.01.97 page 2 / 3
Ref.: EN 100 2001/06

- Product name: DYNASYLAN VTC

TLV (TRGS 900/D): 5 ppm * 7 mg/m3 (hydrogen chloride)

- Industrial hygiene:
  Avoid contact with skin and eyes. Do not inhale vapours / aerosols. Do not wear contaminated clothing.
- Respiratory protection:
  In case of leakage or if TLV is exceeded wear respiratory equipment with suitable filter or a self contained respiratory apparatus.
- Hand protection:
  rubber gloves
- Eye protection:
  close-fitting protective goggles (e.g. closed goggles)
- Further information:
  Use protective clothing / face shield if necessary.

9. Physical and chemical properties

- Form: liquid
- Colour: colourless
- Odour: pungent
- Melting temperature
- Boiling temperature (1013 hPa): 91 °C DIN 51751
- Flash point: 15 °C DIN 51755
- Ignition temperature: 280 °C DIN 51794
- Explosion limits: *
- Vapour pressure (20 °C): 74 hPa
- Density (20 °C): about 1,27 g/cm3 DIN 51757
- Solubility in water (20 °C): not miscible, decomposition by hydrolysis
- pH value (g/l water(°C): not determined
- Viscosity (20 °C): 0,6 mPa s DIN 53015
- Further information: * Vapours can form explosive mixtures with air.

10. Stability and reactivity

- Hazardous decomposition products:
  hydrogen chloride in case of hydrolysis and thermal decomposition
- Hazardous reactions:
  Reacts violently with: peroxides, water, alkalis, acids, alcohols, amines, strong oxidants

11. Toxicological information

- LD 50(oral, rat): 1280 mg/kg *
- LD 50 (derma, rabbit): 864 mg/kg *
- Skin:
  harmful
  markedly corrosive **
- Eyes:
  Severe eye damage must be expected.
- Inhalation:
  irritating **
- Ingestion:
  harmful
- Further information:
  * (literature value)
  ** hydrogen chloride in case of hydrolysis

12. Ecological information

No data available

13. Disposal considerations

- Product:
  with respect to local regulations, e.g. dispose of to suitable waste incineration plant.

14. Transport information

- RID/ADR:
  Class: 3 Item: 21a
  Hazard information No.: X338 UN-No.: 1305
  Name of the substance: X338/1305 Vinyltrichlorsilan, stabilisiert
- ADNR:

Safety data sheet (EC)

hüls

Revision: 25.10.95
Ref.: EN 100 2001/06

print date: 28.01.97

- Product name: DYNASYLAN VTC

Class: 3 Item: 21a
Name of the substance: X338/1305 Vinyltrichlorsilan, stabilisiert
- IMDG-Code:
Class: 3.2 UN-No.: 1305 PG: I EMS-No.: 3-04 MFAG: 700
Proper shipping name: Vinyltrichlorosilane, UN-No. 1305
- ICAO/IATA-DGR:
Class: 3 UN/ID-No.: 1305 PG: I
Proper shipping name: Vinyltrichlorosilane, inhibited UN 1305

15. Regulatory information

- Labelling (EC):
According to Directive 67/548/EEC:
Hazard symbol: C - Corrosive F - Highly flammable
R-phrases: 11 Highly flammable.
14 Reacts violently with water.
22 Harmful if swallowed.
35 Causes severe burns.
37 Irritating to respiratory system.
S-phrases: 7/9 Keep container tightly closed and in a well-ventilated place.
16 Keep away from sources of ignition - No smoking.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

- National regulatory information (D):

Störfallverordnung: cited in Annex IV (Cat.6: highly flammable liquids)
VbF-Gefahrklasse: A I
Wassergefährdungsklasse: WGK = 1 schwach wassergefährdend; (Katalog-Nr.: 557)

16. Other information

Alterations to the previous edition are marked with a "*" in the left-hand margin.

The details contained herein are based on our present state of knowledge and experience and are to characterize our product with regard to any possible safety requirements. We do, however, pass them on without any warranty or property assurances.

Enclosure II

Safety Data Sheet (91/155/EEC)

WACKER
Wacker-Chemie GmbH

0022410 WACKER SILANE V

1.Identification of the substance/preparation and company

1.1 Identification of the substance or preparation:
Commercial Product Name: 0022410 WACKER SILANE V

1.2 Company/undertaking identification:

Manufacturer/distributor:	Wacker Chemie GmbH	
Street/POB-No.:	Postfach 12 60	
State/postal code/city:	D 84480 Burghausen	
Telephone:	0049/8677/83-0	Telefax : 0049/8677/83-3100
Dept. responsible for information: A-CG	Telefax: 0049/8677/83-5590	Telephone: 0049/8677/83-4888
Emergency information:	Works Fire Brigade Emergency Number:	Telephone: 0049/8677/83-2222
Emergency information:	Emergency Response Centre:	Emergency Number: 0049/621/60-43333

2. Composition/information on ingredients

2.1 Chemical characterization (substance):
CAS-No. Designation
000075-94-5 Trichlorovinylsilane
Identification number(s): EC No: 200-917-8

3. Hazards identification

3.1 Critical hazards to man and environment:
EEC/R: 11-14-35-37
Highly flammable. Reacts violently with water. Causes severe burns. Irritating to respiratory system.

4. First-aid measures

4.1 General information:
Observe self-protection for first aid. Take persons to safe place. Keep warm, in restful position, cover up.

4.2 after inhalation:
Move to fresh air, keep the victim laying down and restful. If breathing has stopped, give artificial respiration. Administer oxygen in case of breathing difficulties. Keep warm and in a restfull position, cover with blanket. Seek medical advice and clearly identify substance.

4.3 after contact with the skin:
Wash immediately with plenty of water. In serious cases, use emergency shower immediately. Remove contaminated clothes at once. Seek medical advice and clearly identify substance. Do not use ointments or plasters unless recommended by medical practitoner. Do not take clothing home for washing.

4.4 after contact with the eyes:
Rinse immediately with plenty of water for 10-15 minutes and seek medical advice. Continue to bathe eyes during transport to medical practitioner.

4.5 after swallowing:
Induce drinking plenty of water in small portions. Do not induce vomiting. Rinse mouth with water. Seek medical advice immediately and produce the label or packaging. Never give an unconscious person anything by mouth!

4.6 Advice for the doctor:
Symptomatic treatment.

5. Fire-fighting measures

5.1 Suitable extinguishing media:
dry powder, alcohol-resistant foam, carbon dioxide, dry sand.

5.2 extinguishing media which must not be used for safety reasons:
water, halones.

5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:

Safety Data Sheet (91/155/EEC)

WACKER
Wacker-Chemie GmbH

0022410 WACKER SILANE V

Hazardous combustion products: hydrogen chloride.

5.4 Special protective equipment for fire fighting:
Use respiratory protection independent of recirculated air.

6. Accidental release measures

6.1 Personal precautions:
Wear personal protective suit (see section 8.3).

6.2 Environmental precautions:
Observe local bye-laws.

6.3 Methods for cleaning up:
Absorb with liquid, mainly acid binding material and dispose of according to regulation. Cover lager quantities by foam with small quantities of water and take up in container.

6.4 Further information:
Keep away from sources of ignition.

7. Handling and storage

7.1 Handling:
Precautions for safe handling: Ensure adequate ventilation.
Precautions against fire and explosion: Take precautionary measures against static discharges. Forms explosive mixtures with air, also in empty, uncleaned containers. Vapours heavier than air, therefore inflammable gas mixture mainly near floor.

7.2 Storage:
Conditions for storage rooms and vessels:
Advice for storage of incompatible materials:
Further information for storage: Store in a dry and cool place.

8. Exposure controls / personal protection

8.1 Further information for system design and engineering measures:
Observe information in section 7.

8.2 Associate substances with specific control parameters such as limit values:

CAS-No.	Substance	mg/m3	ppm	F/G	fibre/m3
007647-01-0	Hydrogen chloride	7			

8.3 Personal protection equipment:
General protection and hygiene measures: Do not eat, drink or smoke when handling. Do not breathe vapour. Avoid contact with eyes and skin.
Respiratory protection: gas mask filter E, during prolonged exposure independent of surrounding air respiratory protection.
Hand protection: PVC gloves, rubber gloves.
Eye protection: tight fitting protective goggles, with risk of splashes protective shield. Provide work station with eye bathing equipment. Do not wear contact lenses.
Skin protection: acid-proof protective clothing.

9. Physical and chemical properties

9.1 Appearance:
Form..: liquid
Colour: colourless
Odour.: pungent

9.2 Safety parameters: Method (67/548/EEC):
Change in physical state.....:

Safety Data Sheet (91/155/EEC)

WACKER
Wacker-Chemie GmbH

0022410 WACKER SILANE V

Melting point	<	-78 °C				
Boiling point	=	92 °C	at	1013 hPa		
Flash point	=	13 °C				DIN 51755
Inflammability						
Ignition temperature	=	270 °C				DIN 51794
Autoflammability		°C				
Oxidizing properties						
Explosive properties						
Explosion limits						
Vapour pressure	=	62 hPa	at	20 °C		
	=	235 hPa	at	50 °C		
Density	=	1.26 g/cm3	at	hPa	25 °C	DIN 51757
Solubility in water	virtually insoluble		at	°C	g/l H2O	
pH-value	omitted					
Partition coefficient octanol/water:						
Viscosity	=	0.63 mPa.s	at	25 °C		

9.3 Further information:
Thermal decomposition:

10. Stability and reactivity

10.1 Conditions to avoid:
10.2 Materials to avoid:
Reacts with water, bases, acids, alcohols, ketones/aldehydes to form hydrochloric acid and creating generation of heat.
10.3 Hazardous decomposition products:
If stored and handled in accordance with standard industrial practices and local regulations where applicable: none known.

11. Toxicological information

11.0 General information:
Note indications of danger and safety advice (R- and S-phrases) in § 15.
11.1 Acute toxicity:
no data known.
11.4 Further toxicological information :
Dangerous to health in case of oral intake, inhalation e.g. in the form of aerosol mists and skin contact, especially after long-term exposure.

12. Ecological information

12.1 Information on elimination (persistence and degradability)
no data known.
12.2 Behaviour in environmental compartments:
no data known.
12.3 Ecotoxicological effects:
no data known.
12.4 Further ecological information:
Do not lead into waste water. Do not introduce into inshore waters. Hydrolyzes quickly in water under formation of insoluble silanol compounds.

Safety Data Sheet (91/155/EEC)

WACKER
Wacker-Chemie GmbH

0022410 WACKER SILANE V

13. Disposal considerations

13.1 Material:
Recommendation: Dispose of according to regulations by incineration in a special waste incinerator. Observe the local bye-laws. Special disposal after discussion with the supplier.
13.2 Contaminated packaging:
Recommendation: Fully empty containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local/national bye-laws.

14. Notes on transport

14.1 Land transport ADR/RID and GGVS/GGVE:
GGVS / GGVE.....: 3 Item 21A
ADR / RID.....: 3 Item 21A
Transport emergency card number: 386
Warning board - Hazard No: X338 Substance No: 1305
Description of goods:
Nomenclature: Vinyltrichlorosilane, inhibited
Further information:
Dispatch symbol.....: ** tl:inflammable liquid ** tl:corrosive product
Express.....: not permitted
14.2 Inland navigation ADN/ADNR:
Further information:
14.3 Transport by sea IMDG/GGVsea:
IMDG/GGVsea-class....: 3.2 UN no.: 1305 PG.: I
EmS No.....: 3-04 MFAG: 700
Marine pollutant.....: no
Correct technical name:
Technical name:....:
Proper ship.name...: Vinyltrichlorosilane, inhibited
Further information:
Dispatch symbol.....: ** tl:inflammable liquid/3 ** tl:corrosive product
Page.....: 3290
14.4 Air transport ICAO-TI and IATA-DGR transport by air:
ICAO/IATA-class.....: 3 UN/ID-no.:1305 PG.: I
Correct technical name:
Technical name:....:
Proper ship.name...: Vinyltrichlorosilane, inhibited
Further information:
Dispatch symbol.....: ** HL:This way up ** tl:inflammable liquid/3 ** tl:corrosive product
Packing regulations..: PAC: FORBIDDEN Max.net.:
CAO: 304 Max.net.: 2.5 L
Subsidary risk.....: 8
Air mail transport...: not permitted
14.5 Transport/further information:
Informing dept. ref. to heading 14. Transport information:
Department HG (Gefahrgutburo), Telefax: 0049/8677/83-5589, Telephone: 0049/8677/83-4950

15. Regulatory information

15.1 Identification according to EEC directives
Identification letter and hazard indication of the product:
F C / Highly flammable Corrosive

Safety Data Sheet (91/155/EEC)

WACKER
Wacker-Chemie GmbH

0022410 WACKER SILANE V

contains hazardous component(s) for labelling:

Trichlorovinylsilane F C 11-14-35-37

EC No: 200-917-8

EEC/R:11-14-35-37

Highly flammable. Reacts violently with water. Causes severe burns. Irritating to respiratory system.

EEC/S:7/9-16-26-36/37/39-45

Keep container tightly closed and in a well ventilated place. Keep away from sources of ignition - No smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

15.2 National regulations:

SI 1993/1746: CHIP Regulations 1993

SI 1988/1657: COSHH Regulations 1988

SI 1992/2051: Management of Health & Safety at Work Regulations 1992

Health & Safety at Work Act 1974

Environmental Protection Act 1990 & Subsidiary Regulations

Other national an local measures relating to the workplace, pollution control, environmental protection and waste control.

Further regulations, limits and restrictive regulations:

Substance assessed according to CEFIC.

16. Other information:

n.a. = not applicable n.s. = not subject to

The above information describes exclusively the safety requirements of the product(s) and is based on our present-day knowledge. It does not represent a guarantee for the properties of the product(s) described in terms of the legal warranty regulations.Properties of the product are to be found in the respective product leaflet.